

Guidelines for Cape-friendly Landscapes

for clean water, healthy yards, and our local ecology



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Acknowledgements

Founded in 1968, the Association to Preserve Cape Cod is the leading nonprofit environmental advocacy and education organization for the Cape Cod region, working for the adoption of laws, policies and programs that protect, preserve and restore Cape Cod's natural resources.

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Guidelines for a Cape-friendly Landscape

Principles for Design and Land Care on Cape Cod



Purpose and Background

Since 1970, nearly three billion birds—roughly one-third of the breeding birds in North America—have disappeared ¹ and some 70 species are on the tipping point of extinction.² Globally, 40 percent of all insect species populations are declining.³ One-fourth of our wild bee species in New England are at risk.⁴ The reasons for these alarming declines are attributed to development, pesticide use, fragmented habitat and habitat loss, and the impacts of climate change.

Cape Cod's drinking water comes from groundwater—our sole source aquifer is only replenished by rain and snow melt. When we harden the land with buildings and asphalt, rainwater is not allowed to naturally infiltrate into the ground—instead, it becomes stormwater runoff that contributes to poor water quality in our ponds and estuaries. Some of the water is conveyed away to the ocean or simply evaporates. In recent times of extended drought, Cape towns found it necessary to issue mandatory water conservation efforts.

A 2014 report informed us that nearly six million pounds of fertilizer and 1.3 million pounds of pesticides are applied annually to the Cape Cod landscape, and over 80 percent is from residential use.⁵ Pesticides, whether chemically produced or organic, are meant to kill and do so indiscriminately. Nutrients from fertilizers and stormwater runoff contribute to the degradation of Cape Cod's freshwater ponds and coastal embayments.⁶

Habitats and wildlife corridors, where nature's inhabitants live their lives out, have become fragmented due to development. The Cape has the highest number and highest density of state-listed rare plant and animal species of any region in Massachusetts with a total of 132 state-listed species, including 75 threatened and endangered species.⁷

The typical traditional landscape, dominated by irrigated turf lawn with a few non-native shrubs and trees, has high water and energy requirements for continued maintenance, including the need for fertilizer and pesticides. A landscape of mostly lawn and non-native plants offers little or no wildlife habitat. In light of water quality issues and the need for natural resource protection and conservation, it is time to rethink our landscape choices in design and land care on Cape Cod and beyond.

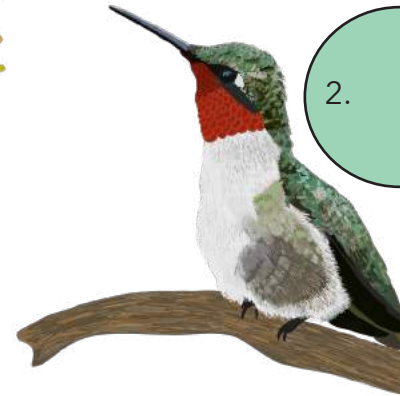
1.



Without a doubt, our managed landscapes intersect with local and global environmental issues. The good news is that our landscapes choices can help support pollinators, birds, and other species, and can help protect the quality and quantity of our water resource.

These guidelines are offered as an overview of the issues and some of the best ecological landscape practices, both in design and maintenance.

Our yards can serve to repair some of the tattered fabric of the Cape with choices and land care practices that are mindful of nature. Use of native plants and chemical free yards that welcome Mother Nature can mend the connectivity of ecosystems, provide pathways for pollinators, and steppingstones for wildlife between wild areas.



1. 2019 State of the Birds - stateofthebirds.org/2019
2. 2022 State of the Birds - stateofthebirds.org/2022
3. Worldwide decline of the entomofauna: A review of its drivers - Biological Conservation, 2019
4. Pollinators in Peril, 2017 - biologicaldiversity.org/campaigns/native_pollinators
5. Cape Cod Pesticide and Fertilizer Use Inventory, 2014 - capecodcommission.org
6. State of the Waters: Cape Cod, 2022 - capecodwaters.org
7. Wildlife and Plant Habitat Technical Bulletin, 2019 - capecodcommission.org



NATURE is at the heart of a Cape-friendly landscape

SOIL

Just one teaspoon of healthy soil can contain anywhere from 100 million to one billion bacteria and several yards of fungal filaments called mycelium that spread through soil in a web-like network. There can be upwards of 7,000 one-celled animals called protozoa, scores of nematodes, and dozens and dozens of arthropods in various life stages, such as beetles and centipedes, all living together in the soil.

Soil is made up of minerals, organic matter, water, air, and of course, living organisms. Minerals include calcium, manganese, nitrogen, and potassium. Calcium is essential for building cell walls and other essential biological processes. Manganese is a component of chlorophyll, which is essential for photosynthesis, the process by which plants produce food (carbohydrates) with the energy of the sun and carbon dioxide. Nitrogen is an essential component of proteins, which plants use for many purposes. Potassium helps regulate water use and assists plants with drought stress. Organic matter (that is, chemicals containing carbon bound to other elements) makes up about 5 percent of soil and comes from decomposed organisms; organisms that also provide all their chemical components (nitrogen, phosphorous, sulfur, etc.) for use by other living soil organisms.

Water is critical as a solvent and carrier for plant nutrients. Microorganisms require water for their metabolic processes. There is more carbon dioxide in the soil than in the air we breathe. Soil supplies the infrastructure for plants to grow.

Healthy plant life, the way nature intended it to be, involves a mutual relationship between plants and soil organisms. Soil organisms help decompose organic matter, making nutrients available for plant growth. The larger organisms, including pill bugs and ants, feed on organic matter and add nutrients to the soil through their waste. Importantly, they help aerate the soil that allows for root penetration, water infiltration, and the spread of beneficial bacteria in the soil.



3.





As plants convert carbon dioxide into carbohydrates through photosynthesis, they exude sugars to the bacteria and fungi via their roots. These microbes then help convert atmospheric nitrogen into usable forms for use by the plant for growth, (the air we breathe is about 78 percent nitrogen), and also help make minerals and other nutrients available to plants. Some of the microbes create beneficial networks that reach well beyond the immediate roots of the plants to expand their ability to harvest and deliver water and nutrients. Some soil organisms, like protozoa, eat bacteria and fungi, helping to keep balance in the soil ecosystem.

*To encourage and support healthy soil life,
avoid the use of fertilizers, fungicides, and other pesticides.*

While chemical fertilizers supply specific nutrients directly to the plants, fertilizers are in essence artificial life support. These fertilizers do not replace the other kinds of food bacteria and fungi need, and instead disrupt and destroy the natural function of soil life.

Soils with more organic matter tend to have more soil life. Therefore, feed and protect your soil organisms by leaving the leaves where you can, and recycling nutrients on your site through composting. Leaves provide important lignin depended upon by soil organisms for a food source. Leaves also protect the moisture in the soil and provide winter protection to the soil ecosystem.



INSECT LIFE



One of the tenets of ecological landscapes is understanding that every species has its place in the world, even though we may not know their role or don't particularly like them.

As Edward O. Wilson said about ants, "they are the tiny things that run the world." Indeed, while insects and other invertebrates often get a bad rap, they are crucial to life on the planet. Plants and insects are inextricably bound to each other in complex relationships that evolved over millions of years. In this co-evolution, plants and insects indigenous to our region have come to depend on each other to ensure the continued survival of their species.

5.

Plants developed various defense mechanisms to deter being eaten by insects and other wildlife. These defenses may be physical, such as prickles or thorns. It may be that they hold onto their leaves over the winter to protect next year's buds from being browsed. Most commonly, plants developed a chemical defense that repels the herbivore and makes the plant distasteful or even toxic.

As plants developed their unique defenses, insects were busy in their evolution figuring out a workaround to the deterrents. Therefore, insects tended to specialize and focus on certain plant species, and these are the plant species called host plants. These plants serve as food for



some stage of the insect. For butterflies and moths (lepidopteran), the winged stage may readily take nectar from most any flower, but their larvae (caterpillars) are finicky about the plants they consume for nourishment.

They may have specialized on a certain genus of plants or group of plants. The most charismatic and common example of this specialization is the monarch butterfly and its caterpillar that is solely dependent on milkweed as food: no milkweed, no monarchs. Native insects require native plants.



Pollinators enjoy recent popularity and for good reason. Many of our food crops require insect pollination, but most importantly, most of our wild plants require pollination by insects in order to produce seeds for the next generation. You may be surprised to know pollinators are not just bees, but a variety of insects that include moths, flies, beetles, and even wasps. Native plants need insects.

In New England, we have approximately 400 native wild bee species. Bees evolved from wasps and became vegetarians that depend on nectar and pollen of flowers for their food and to feed their young. Unlike the non-native European honeybee that creates a hive of thousands that they aggressively defend, the vast majority





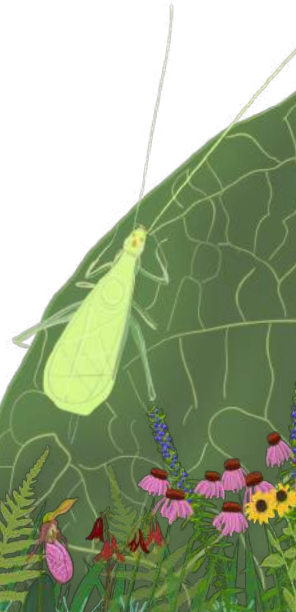
of our wild native bees are solitary nesters. It is the female that creates the tunnels where she lays an egg, one at a time, and provisions it with pollen and nectar. Some species tunnel down into the ground within the top few inches. Others specialize in choosing the stem of a plant. And others that are larger, like the biggest of our bees, the carpenter bee, are able to chew into wood.

Adult wasps will sip nectar and move some grains of pollen in doing so. Depending on her species, she will either hunt or parasitize other insects to supply her young with the protein they need to develop because her larvae are meat-eaters. Like our wild bee species, the majority of wasps are also solitary nesters, with the exception of hornets and yellow jackets that will defend their collective nests. But these insects are predators that are valuable to help keep the balance in the garden.

Predatory insects feed on other arthropods, their larvae, and eggs. Other predatory insects include fireflies, lacewings, beetles, some stinkbugs, long-legged flies, and, as the name implies, assassin bugs. The unloved earwig is an omnivore and feeds on a variety of materials including many insects. The larvae of ladybugs and flower flies love to eat aphids. Tachnid flies parasitize a variety of insects. Let's not forget the diverse group of eight-legged arachnids—the spiders that live in our landscape and trap their protein meals.

In addition to pollination and keeping the biological balance, there are other tasks and interactions we continue to discover. Did you know ants help to aerate the soil, and also distribute seeds of wild ginger, violets, and blood root? Insect life is essential to food webs and stable ecosystems—they are food for other animals, they are predators, and some are garbage collectors that break down dead plant material, making the nutrients available to nature's recycling scheme.

To learn more about insects and other invertebrates and their fascinating life cycles and interactions with plants and each other, see the list of recommended resources.

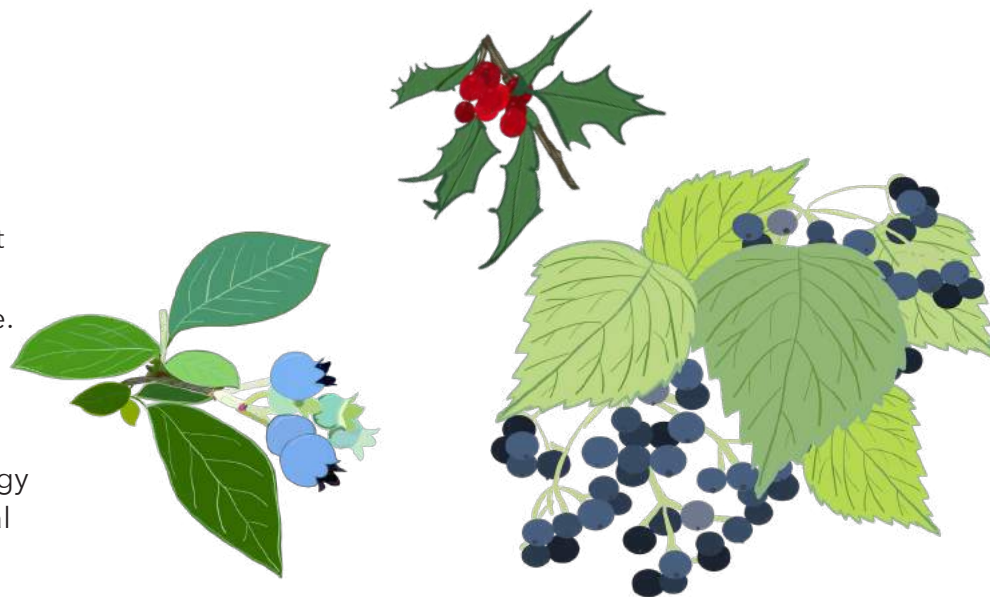


BIRD LIFE

Our yards are important for supporting bird populations. Landscapes designed with birds in mind are those that provide nesting sites, protective cover from the weather, and hiding places from predators. Most importantly, our landscapes can be a source of food year-round. Bird lovers who enjoy their bird feeders have an opportunity to feed the birds naturally by choosing native plants that supply seeds, fruits, berries, and insects.

7. Like insects and other invertebrates, birds have evolved with native plants. A 2020 study published in *Biological Conservation*¹ found birds prefer native fruits, and in most cases, these native berries contain more of the fats, carbohydrates, and nutrients that the birds need to survive. In contrast, fruits from exotic invasive species are usually nutrient poor. Native viburnums, such as arrowwood viburnum (*Viburnum dentatum*), provide fall berries that provide the fats and carbohydrates that give needed energy for migrants and the antioxidants that alleviate the physical stress they endure in their long flights.²

During the winter months, some native deciduous shrubs desired by birds include northern bayberry (*Morella pensylvanica*), staghorn sumac (*Rhus typhina*), Washington hawthorn (*Crataegus phaenopyrum*), native hollies that include winterberry (*Ilex verticillata*), American holly (*Ilex opaca*), and inkberry (*Ilex glabra*). The vivid blueberries of eastern red cedar (*Juniperus virginiana*) are technically cones, but no less a favorite food of bluebirds and cedar waxwings.



Plant a diversity of natives to stretch the availability of food throughout the year. Remember, some birds, like goldfinches, are granivores, or seedeaters. Their go-to foods are the seeds from flowers in the Asteraceae family, such as asters and sunflowers. They also forage seeds from elm, birch, and alder.



Over 95 percent of our North American terrestrial birds depend on caterpillars to feed their babies. Caterpillars (the larvae of butterflies and moths) require native plants. This is the most critical connection between native plants and birds. For healthy bird populations, our landscapes need to supply native plants that moths and butterflies will find suitable to lay their eggs, thereby providing enough caterpillars to feed the birds when they most need them—during nesting season.

Birds need our landscapes for more than just food. If you are knowledgeable about birds, you know that some birds make fancy nests like the Baltimore oriole, which weaves a hanging nest high up in a tree, or the hummingbird, which uses lichens to create its tiny nest. Where a bird builds its nest depends on the bird species. Numerous birds are cavity nesters, which means they look for a hollow within a tree or birdhouse with just the right sized hole. Some birds are ground-nesters, and others have preferences of certain height off the ground.



Planting hedgerows, retaining some wild areas, and designing with perennials, shrubs, understory trees and canopy trees are ways to provide a variety of potential nesting sites for the greatest diversity of birds, while also providing food sources.

Dead wood is good wood. Dead trees, called snags, provide a natural feeding station for woodpeckers and nesting sites for any number of those cavity nesting birds. Leaving the leaves will attract towhees that noisily kick up the leaves looking for insects.





Some steps you can take to support birds in your yard with food, shelter and nesting places:

- Plant more native species that are highly valued food sources for birds. A diversity of species is desirable, and more than one plant per species is even better!
- Leave the leaves, leave the seeds.
- If you can safely leave a dead tree standing, you'll find it to be a wonderful attraction for birds of all kinds.
- If a tree becomes unsafe, consider having only the upper part of the tree removed, leaving the trunk standing at a safe height for you, and allowing it to decay naturally.
- With safety in mind, allow dead branches to remain because they are best for perching.
- If your site allows, plant a hedgerow.
- Retain wild areas of any size.
- Allow plantings to knit together and fill in.
- Avoid the use of pesticides. Even organic pesticides are meant to kill, and all do so indiscriminately.
- Avoid the use of rodenticides. Birds of prey and other predator species that consume poisoned rodents bioaccumulate the poisons and die a slow death.

9.





1. Can invasive species replace native species as a resource for birds under climate change? A case study on bird-fruit interactions. *Biological Conservation* 2020 - [sciencedirect.com](https://www.sciencedirect.com)
2. Better Berries for Birds. National Wildlife Federation 2021. [nwf.org/Home/Magazines/National-Wildlife/2021](https://www.nwf.org/Home/Magazines/National-Wildlife/2021)



DESIGN PRINCIPLES - Tips and Benefits



Location, Location, Location

Know Your Site

In order for plants to grow successfully, they need to be planted in the proper location. One tip is to create a map of your yard. This will help you make informed decisions about where to create a garden and to locate plants throughout the property.

Underground Utilities

It's important to know the location of any underground utilities, such as buried gas, water, or electrical lines, and cable. If you plan to put a shovel in the ground, first call Dig Safe at 811. (For more information, go to Dig Safe¹ and the MA Dig Safe Guide.²) It's a free service and someone will come out and flag any underground public utility lines. They will not, however, identify any irrigation lines or underground lines between buildings that you or the previous owner may have installed.

Your Septic System

The vast majority of homes on the Cape are on septic systems.³ If this is your situation, you will want to know where your septic system components are located. If you don't know, your local health department should have a plan that provides you with distances to each of the components as measured from a corner of the foundation.

It's good to avoid planting shrubs and trees over the septic tank, distribution box, and cleanouts. Tree and shrub roots will likely invade and over time clog up the system. When planting over the leaching field, it's best to use plants that have shallow roots.





Sunshine and Shade

Plant selection will depend on how much sun an area receives. On the map, include the cardinal directions (north, south, east and west). This will generally dictate the amount of sun or shade your property receives.

South. Your home's south-facing area will typically get more than eight hours of bright direct sunlight per day, making it perfect for full sun-loving plants.

West. The westerly facing side of your dwelling typically receives four to six hours (possibly more), starting in the early afternoon. Plants that are identified as part shade or part sun (terms used interchangeably) are good choices here.

North. The north side of the house often doesn't receive direct sunlight, particularly close to the building. Shade-loving plants are those that do well in four hours or less of direct sunlight.

East. The east facing gardens receive the morning light, which can extend into the early afternoon, depending on other shading factors such as trees. Plants that are identified as part shade or part sun (terms used interchangeably) are good choices here.

12.

Be observant and make notes: Likely there are other conditions unique to your property, such as existing trees that cast shade, which result in exceptions to the general guidance.





Other Site Characteristics

Wind. You will want to note if and where you experience direct wind. The prevailing wind is from the southwest but in winter storm events, typically the wind is from the northeast.

Do you live where you can see the ocean? If so, portions of your property may be exposed to salt spray—wind off the ocean that is laden with salt. This will be important for plant selection. If your property is exposed to winds during northeast storms, you may wish to consider planting a wind buffer, such as groupings of evergreens.

Soil. Much of Cape Cod is sandy, low in organics, and naturally acidic. You may be in an area where there are pockets of clay. It's very helpful to know your soil and its propensity for holding moisture. Unlike growing seasonal vegetables, our landscape plants are here for the long haul and should be selected based on the existing soil. Supplying soil amendments year after year to satisfy a non-native species is not sustainable.

13.

Got Weeds? The common definition of a weed is a plant in the wrong place, but some plant species from other parts of the globe can be especially problematic weeds, and we refer to them as invasive species. Plants that get listed on the official prohibited plant list for Massachusetts are species that have been found to be especially aggressive in spreading either through roots or by seed and have “invaded” wild areas, squeezing out native plant species. Just a few Cape Cod examples of non-native invasive species are: Japanese knotweed, Asiatic bittersweet, Japanese honeysuckle, multi-flora rose, and porcelain berry.

While the Commonwealth has an official list, there are many other non-native species that have invasive tendencies, and therefore it is best to plant native. If you have one or more invasive species on your site, learn best practices to control them because the methods of control vary from species to species. More information can be found on the website of Massachusetts Audubon.⁴





MA Prohibited Plant List⁵ is a list of plants, including all cultivars, varieties, and hybrids, for which the sale, import, trade, purchase, distribution, propagation, and related activities are currently prohibited within the state of Massachusetts.



1. digsafe.com
2. mass.gov/guides/about-dig-safe
3. mass.gov/doc/cape-cod-regional-wastewater-management-plan-overview
4. massaudubon.org/learn/nature-wildlife/invasive-plants
5. mass.gov/doc/prohibited-plant-list-sorted-by-common-name





Choose Natives

The natural areas of Cape Cod are filled with distinctive vegetation that gives us a sense of place. Walking through natural areas, we find a diversity of native plants that evolved and adapted to their environment without human intervention. Our insects and other wildlife co-evolved with plants, creating mutually beneficial interactions that are integral to their life cycles. Plants provide food, protective cover, and a place to raise their young. As a result, nearly every form of life on the planet relies on native plants for survival.¹



Locations where these relationships exist are identified as ecoregions—geographical areas with similar climate, soil, geology, hydrology, and landform types. Cape Cod is part of an ecoregion, with populations of plant species and wildlife that share similar needs and conditions. Choosing species that are native to this ecoregion are good choices for our landscapes. Planting a variety of native flowering plants, grasses, vines, trees, and shrubs provides benefits to wildlife throughout the seasons, supporting diverse creatures that depend on them.

15.

For the utmost authority on the nativity of plant species to our eco-region, go to GoBotany/NativePlantTrust.org.²

Why Native Plants?

Native plants are particularly well-suited for their region of origin. They are adapted to the range of seasonal temperatures, annual precipitation, and soil conditions. Many species native to our area are accustomed to the Cape's nutrient-poor soils that are low in organics, and they will thrive without the use of pesticides and fertilizers. We know that fertilizers contribute to the degradation of water quality in our coastal embayments and freshwater ponds. By choosing native plants, there is little need to add nutrients to the soil that will end up in our waterways and groundwater. Therefore, replacing exotic species with native plants will help the Cape-wide effort to improve and protect water quality.

When sited in the right place, and once roots are established, native species do not typically require watering. The only caveat is that even some native plants may suffer and even succumb to extreme drought (four or more weeks without rain in the heat of summer).

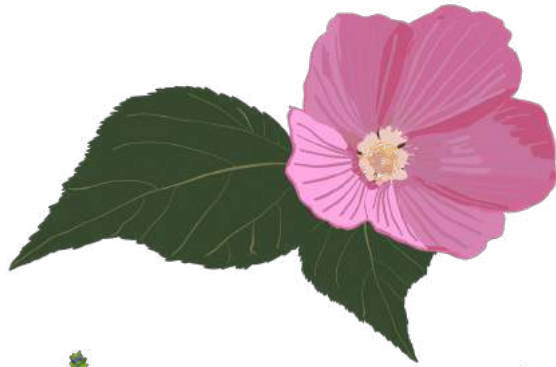


When we say a plant is native, its nativity relates to its ecoregion. So, while Colorado spruce is native to parts west, it is not considered a native species appropriate for Cape Cod as it prefers conditions where the climate is cool, the summer is wet, and where most summer days don't get much above 70 degrees.³ That's not Cape Cod's climate!

Many of our native species are drought tolerant and salt spray tolerant. The quintessential Cape Cod beach plum, bayberry, seaside goldenrod, and eastern red cedar are just a few of the species that are well-adapted to the toughest of coastal locations like sand dunes, making them perfect choices for a seaside landscape, or most anywhere on the Cape. Examples of the adaptations of coastal native plants to drought and salt include the succulent leaves of the seaside goldenrod and the waxy leaves of the bayberry that help the plants hold and retain moisture despite the salt-laden air that desiccates plant cells.

The most compelling reason for choosing native plants for your Cape Cod landscape is their value to the local ecology – the life around us. Pollinators, birds, and the other creatures depend on native plants and their relationships make up local food webs. The research of University of Delaware entomology professor Dr. Douglas Tallamy supports the inextricable role of native plants in local food webs. Much of his work has focused on lepidoptera (moths and butterflies). He has identified “keystone species” of native plants—those that have a disproportionate effect on the abundance and diversity of species. Working with the National Wildlife Federation⁴, he has helped to create a list of plant species with the greatest wildlife value, and he encourages planting these species for the greatest support of number and diversity of species.

There are native plants for every site condition. Resources to identify them include the National Wildlife Federation⁵, Association to Preserve Cape Cod⁶, Native Plant Trust⁷, the Lady Bird Johnson Wildflower Society⁸, and the National Audubon Society Native Plants Database.⁹



1. nwf.org/NativePlantFinder
2. gobotany.nativeplanttrust.org
3. conifersociety.org/conifers/picea-pungens
4. nwf.org/Garden-for-Wildlife/Keystone-Plants
5. nwf.org/nativeplantfinder
6. capecodnativeplants.org
7. plantfinder.nativeplanttrust.org/Plant-Search
8. wildflower.org
9. audubon.org/native-plants





The Scoop on Cultivars and “Nativars”

Plants in the wild have tremendous genetic diversity that provides adaptability and resilience in the face of environmental changes, disease, and other stressors. Each seed that is produced has genes that determine germination timing, when it flowers, how it reproduces, its growth habit, its physical characteristics (such as color), and a whole host of other traits. A wild plant species is referred to as a straight species. However, many plants in the mainstream horticulture trade are cultivars. A cultivar is a plant that has been produced by cloning and hybridizing to select for certain desirable genetic variations that appeal to the consumer. This ensures continuity of characteristics that are valued by consumers such as compact growth, extended bloom time, double flowers, and color variation. In nurseries, cultivars are typically identified by a name in quotes. For example, a cultivar of the native species *Echinacea purpurea* is *Echinacea purpurea* ‘Avalanche.’ The label of a straight or true native species would simply read *Echinacea purpurea*. Native plant species that are cultivars are sometimes referred to as nativars.

17.

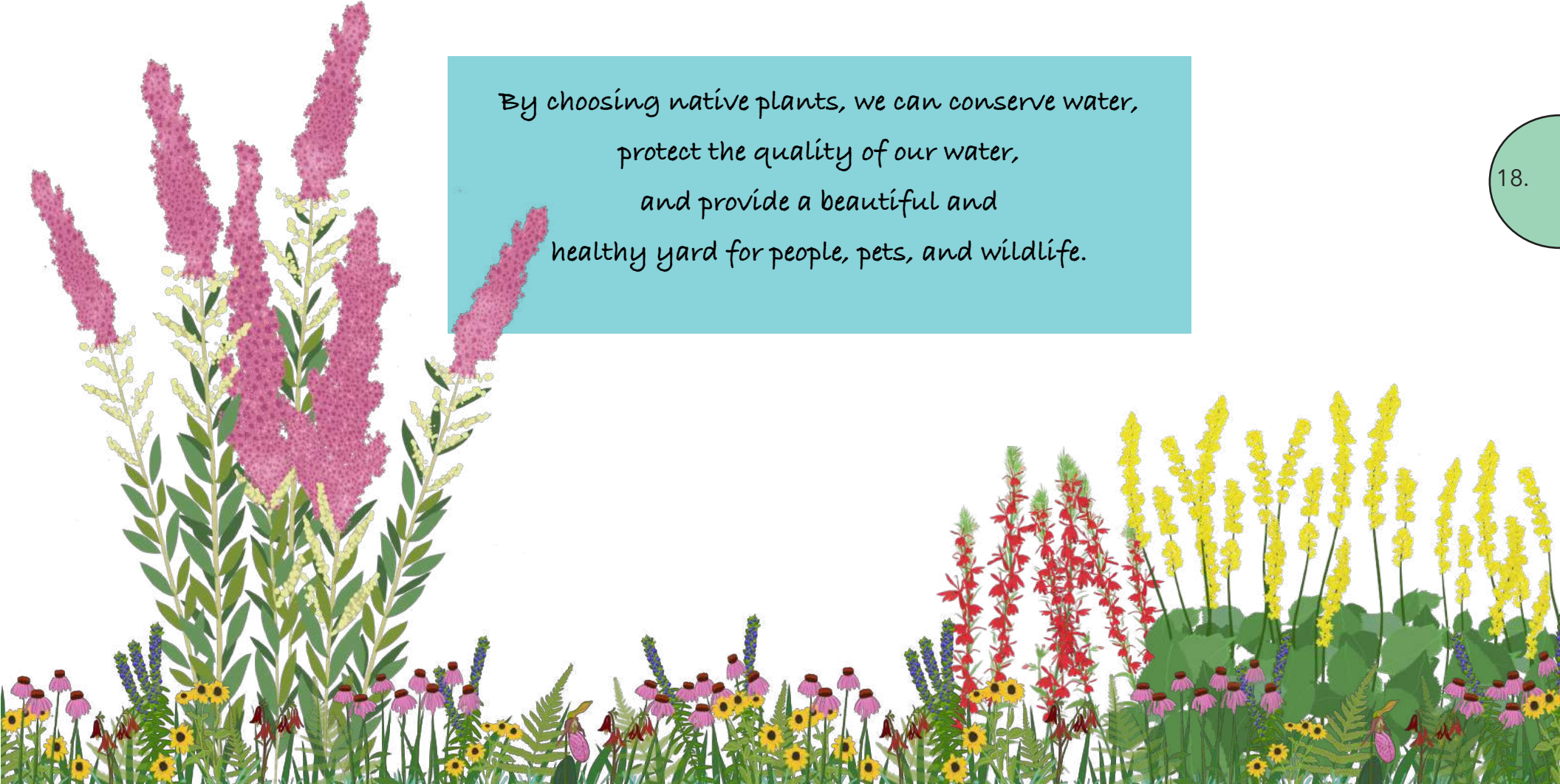
Are these native cultivars more or less attractive than straight species to pollinators? A study conducted by Dr. Annie White from the University of Vermont concluded that pollinators found many cultivars not as desirable as the true native species.¹ Gardeners need to be cautious of cultivars with double or triple blossoms, which often inhibit pollinators’ ability to access the nectar and pollen inside. And some cultivated plants, such as ‘Annabelle’ smooth leaf hydrangea (*Hydrangea arborescens*), have infertile flowers that have no reproductive structures or pollen, making them useless to pollinators. However, she also found evidence that at least one native cultivar selection was superior in supporting pollinators, providing more nectar over a longer bloom time.² She summarized that while some native cultivars may be comparable substitutions for native species in pollinator habitat restoration projects, all cultivars need to be evaluated on an individual basis.

At the Mt. Cuba Center in Delaware, research in trial gardens evaluates native plants and their cultivars for horticultural and ecological value, highlighting the ecosystem services native plants provide.³ Dr. Tallamy studied six plant traits that included height, growth habit, variegated foliage, and others, and found that caterpillars did not have a preference for either the straight species or the cultivar species. What did make a difference, however, was if the leaf color was red or purple instead of green. Leaf-eating insects were less apt to feed on a plant with this coloration—likely because of anthocyanins, the chemicals responsible for color, which are a feeding deterrent to most insects.⁴



1. scholarworks.uvm.edu
2. grownativemass.org/Great-Resources
3. mtcubacenter.org/research/trial-garden
4. awaytogarden.com/nativars-with-doug-tallamy

Note: While native species are the best choice for a Cape-friendly landscape to support pollinators, birds and other life that make up the local ecology, help conserve water, and protect the Cape's water quality, it doesn't mean you have to remove everything that is already in your landscape (unless there are invasive species). Simply supplementing your yard with as many native species as you can is helpful.



*By choosing native plants, we can conserve water,
protect the quality of our water,
and provide a beautiful and
healthy yard for people, pets, and wildlife.*

Plant abundantly and in layers

There is a saying, “Mother Nature abhors a vacuum.” In our gardens, any bare soil is an open invitation to weeds. By planting densely, we create a viable barrier to weeds by taking up the vacant real estate with the plants of our choosing. Some plants are particularly good at filling an open area and will spread quickly—a growth habit that can be advantageous when it’s what you desire, and one to avoid if you do not.

Dense plantings also help prevent soil erosion, recycle soil nutrients, moderate temperature, and help retain soil moisture. Plants do best when living in community with others, where soils are healthy, fungal networks are established, and nutrients are recycled. Rather than using typical wood mulch that needs to be refreshed each season, consider “living mulch”—that is, more plants. Dense plantings help you avoid the inclination for annual wood mulch applications. Avoiding the annual wood mulch applications will save you money, and wood mulch offers no life, whereas live plants contribute value to wildlife.

Planting densely can support biodiversity when we choose different native species that vary in heights and growth habits. This is referred to as “matrix planting.” To create a sustainable and beautiful tapestry in the landscape, there is great value in taking time to learn about plants, particularly their growth habits and growth rates. With this understanding, selecting species that will work together will help create a sustainable tapestry, reducing maintenance. Put your well-thought-out

plan on graph paper. For help in doing this, in a series of videos, plantsman and designer Roy Diblik gives technical and philosophical advice on how to go about your garden design. [www.youtube.com/c/RoyDiblik]

There are some examples of plant combinations that will thrive together. These are called plant guilds. For instance, beneath a deciduous tree it would be appropriate to have long beech fern, foamflower, woodland phlox, and white wood aster. These will serve as the living mulch, cover the area, and will also provide “soft landing” area for pollinators whose life cycle may begin in the tree, but who must overwinter in the leaf litter for the next phases of their life cycle.

Taking a cue from natural woodlands, a landscape design incorporating plants of different types to create vertical layers will support the greatest diversity of wildlife. The lower layer is composed of herbaceous plants of various growth habits. The next layer is shrubs, preferably those that flower and fruit to support pollinators and birds. A third layer could be small-sized understory trees, such as bear oak (*Quercus ilicifolia*), sassafras (*Sassafras albidum*), and pagoda dowood (*Swida alterniflora*) that also support native pollinators. Taller trees make up the top canopy layer. These layers help moderate soil temperature and moisture levels. Bird species each have their preference for nesting locations.



Some birds nest in shrubs and hedges, while others prefer taller trees, such as the Baltimore oriole that weaves a hanging nest high above the ground near the end of a tree branch, hidden from view. A vertically stratified landscape offers the greatest opportunities for a higher diversity of bird species. And layering is a basic principle of good garden design as it creates aesthetic balance and visual interest.

When we wisely choose keystone native plant species, plant densely and in layers, our landscapes can be especially beautiful and beneficial to wildlife and biodiversity: a win-win for all living things.

Canopy

Hawks, Crow, Owls
Vireo, Oriole,
Woodpeckers

Mid Story

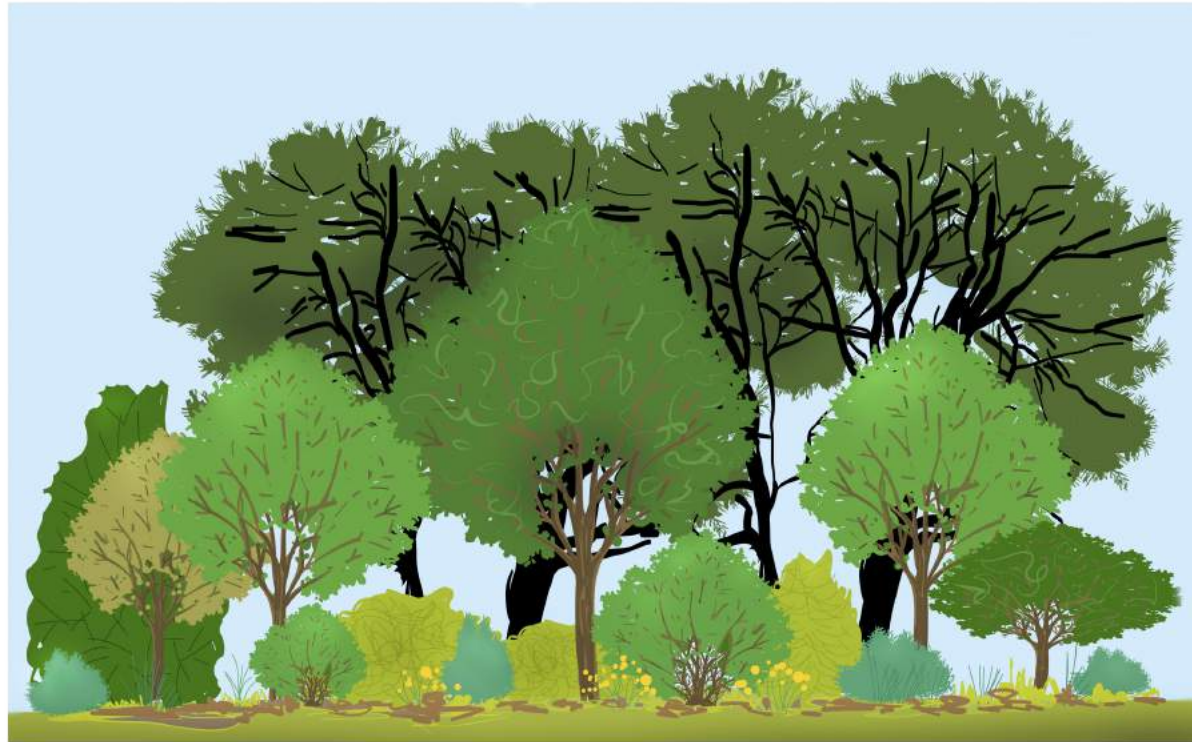
Bluejays, Cardinal,
Chickadee, Waxwing,
Warblers

Understory

Mockingbird, Bluebird,
Wren, Kinglet, Phoebe
Catbird, Sparrows

Herbaceous layer and Ground

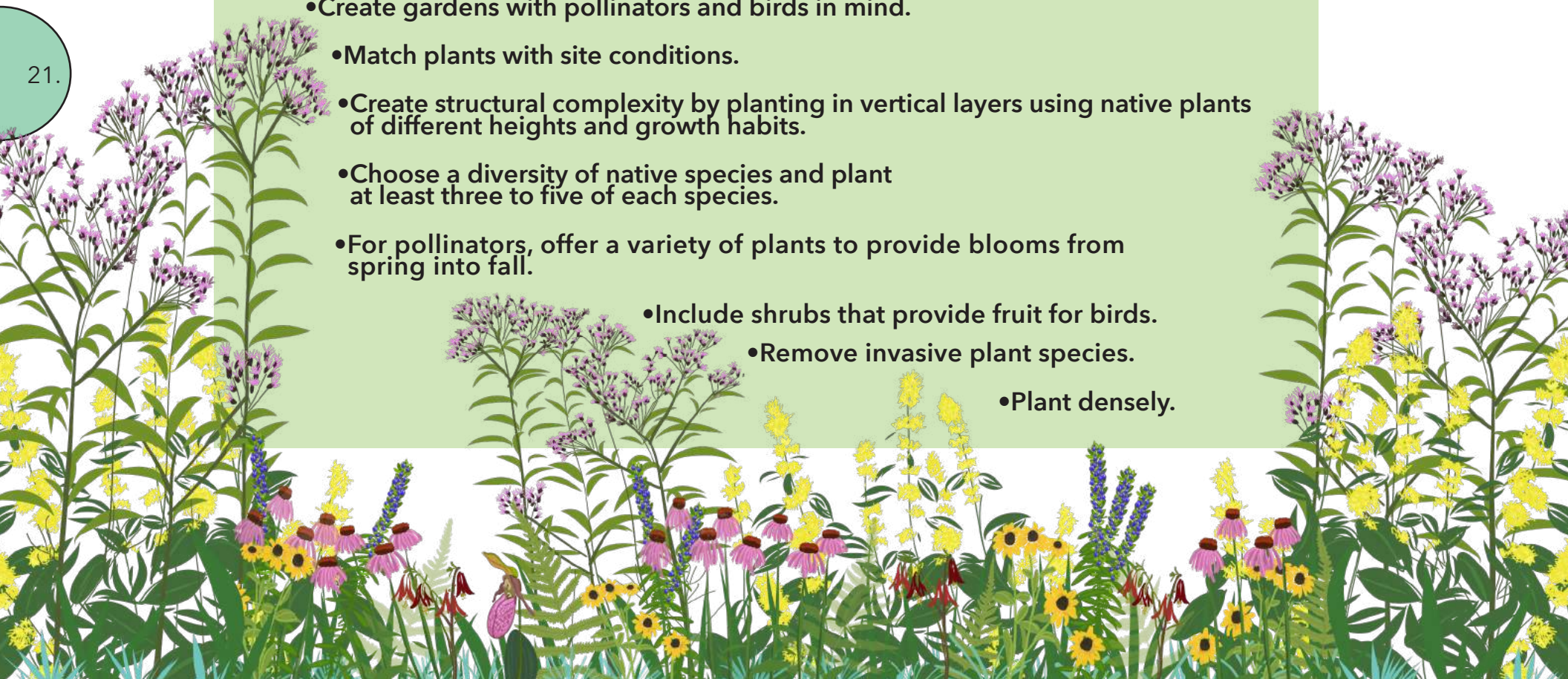
Towhee, Sparrows,
Quail, Waterfowl,
Wading birds



Plant for Function

Planting for function means making choices that will give you the biggest bang for your buck in supporting nature in your landscape, such as incorporating plants that have the greatest ecological value and designing in ways that optimize your landscape's benefit to wildlife. To support the highest biodiversity in your yard, the following tips are recommended:

- Select keystone native plants that are known to provide the highest level of wildlife value.
- Reduce lawn area where possible and replace with native species.
- Create gardens with pollinators and birds in mind.
- Match plants with site conditions.
- Create structural complexity by planting in vertical layers using native plants of different heights and growth habits.
- Choose a diversity of native species and plant at least three to five of each species.
- For pollinators, offer a variety of plants to provide blooms from spring into fall.
- Include shrubs that provide fruit for birds.
- Remove invasive plant species.
- Plant densely.



What do we know about the ecological value of each plant species? For trees, Dr. Douglas Tallamy from the University of Delaware identified native species that are especially important to food webs because they support the greatest number and biomass of lepidoptera (moths and butterflies whose larval stage is the caterpillar). These are called “keystone plants.” Examples include oaks, black cherry, willow, birch, and poplar.¹

Why is this important? The vast majority of terrestrial birds rely on caterpillars to feed their young. A single pair of breeding chickadees must find 6,000 to 9,000 caterpillars to rear one clutch of fledglings. Research conducted by Dr. Desiree Narango, U. Mass Amherst, assessed the impact non-native species have on the breeding and foraging behaviors of the Carolina chickadee. She found that neighborhoods with less than 70 percent native plants had a drastically reduced success rate for baby birds fledging, and that the presence of at least 94 percent native plants was ideal.²

1. nwf.org/Garden-for-Wildlife/Natures-Best-Hope
2. pnas.org
3. nwf.org/Garden-for-Wildlife

Keystone Plants - Of our native plant species, 14% support 90% of butterfly and moth species, and 40% of native plants are critical to native wild bees that are pollen specialists.³





Trees



Trees are the living infrastructure of our landscapes and our communities.

Trees help moderate temperature in the landscape. On a hot and humid summer day, we all have experienced the physical and mental relief from the shade of a tree. Trees help reduce the energy it takes to cool your home. In downtown areas, trees can help moderate the heat sink created by the predominance of black pavement, concrete, and buildings. In addition to shade, trees transpire water vapor that has a cooling effect.

Trees play a crucial role in the water cycle. A typical tree breathes out 250 to 400 or more gallons of water per day through the amazingly large surface area of its leaves. An acre of forest can contain well over 1,000 acres of leaf surface area. This moisture in the air then condenses somewhere in the region and it rains. Many examples around the world show how clear cutting of forests has resulted in desertification, which is the creation of deserts. On the flip side, there are examples of how forest restoration efforts have reversed the desert conditions and restored the local water cycle.

Trees help with the replenishment of the Cape's groundwater and protect water quality. Much of our landscape is hardened with buildings and pavement where rainwater evaporates on a hot day or is directed into catch basins and disposed of without treatment. The leaves and branches of trees intercept the rain drops and reduce the velocity of the rain so that the water has a chance to soak slowly into the ground and be cleansed before it reaches groundwater and our aquifer. The rain that comes through the leaves and branches is called "throughflow" and the rain that cascades down a tree trunk is called "stemflow."

All living things are made of carbon and so are trees. Find an 18-inch diameter oak tree and appreciate that it is storing about three tons of carbon. A tree's capacity to store carbon from the atmosphere can be for hundreds of years. An acre of forest can grab/sequester more than one ton of carbon out of the atmosphere per year—and, of course, give back oxygen. Carbon is not only stored in the tree we see, but in its extensive root system as well as the associated soil organisms.

Trees are habitat. And protecting habitat is vital, especially when the climate change impacts to species are not yet well known. Trees support the local food webs. For example, oak trees support oodles of different kinds of caterpillars that are essential food for nesting birds.





Trees provide beauty. Trees give real estate value to our properties and make our communities attractive and green.

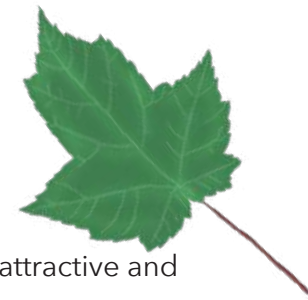
Choose local species for planting in your landscape—look for those species that are found in wild areas for best success and to support wildlife. On Cape Cod, our woodlands are predominantly oak-pine forests that consist of bear oak (a.k.a. scrub oak), red and white oaks, eastern red cedars, sassafras, black cherry, American holly, pitch pines, and white pines.¹

Preserve existing trees! Appreciate that a 12-inch diameter oak may very well be 40 years old.

If you can do it safely, allow dead trees to remain. Many of our birds are cavity-nesting birds and need the protective void within a branch or trunk to create a nest. Other creatures like bats and small rodents also find important protective cover.²

If a dying or damaged tree poses a safety threat, consider asking your tree contractor to leave the trunk standing 12 feet or whatever is safe in your circumstance. If an oak or cherry, it may re-sprout and will therefore continue to be a food source for the many insects that dependent on oak foliage. Dead standing trees are called snags and their slow decomposition is a source of food for insects and invertebrates that in turn are food for birds, such as woodpeckers, flickers, nuthatches, brown creepers, titmice, and chickadees.

1. ag.umass.edu/fact-sheets
2. nwf.org/Garden-for-Wildlife/Cover/Trees-and-Snags



24.



Trees are as close to immortality as the rest of us ever come.

Karen Joy Fowler



A Cape Cod Lawn

If you have lived on the Cape long enough, you know what a Cape Cod lawn is. Some older properties still retain these mosaics of moss and a variety of native species that may include sedges, violets, wintergreen, low bush blueberry, bearberry, and native little bluestem grass. This is what a Cape Cod lawn is composed of, basically whatever will grow in the poor sandy soils of our region. Often there are mosses of different kinds, and sometimes what grows has flowers, like blue-eyed grass (*Sisyrinchium montanum*).

A Cape Cod lawn is an open area that is not irrigated, fertilized, or otherwise treated with chemicals. It is diverse with species, undulating with height of plants, a natural area, except for maybe an occasional mowing as necessary to maintain walkways during the growing season. It goes dormant in the heat of the summer and many a true Cape Codder brags about the last mow for the summer at the end of June and not having to touch the mower until September for the last time in the calendar year!

The traditional turf lawn of suburbia demands water and lawn chemicals. Our Cape summers are dry, and even hotter and drier in recent years with watering bans in almost all Cape communities. Our waterways are overburdened with nutrients, some of which come from fertilizers and stormwater. The fact is that the traditional lawn just doesn't work on Cape Cod.

You have permission to have a Cape Cod lawn because, after all, you live on Cape Cod, and aren't there better ways to spend your time and money?





Granted, this means a societal change for some. But change can happen. We already have an alternative and it's the Cape Cod lawn. And maybe, as the author of *A New Garden Ethic*, Benjamin Vogt says, "we just have to 'rethink pretty.'"

Changing a social norm is possible. Remember when we made the healthy move to ban smoking from public spaces? Some thought it was an impossible change, but it happened, and we are all better for it. So too, we can move from fertilized lawns to a good old Cape Cod lawn.

If you already have a Cape Cod lawn, know that your yard demonstrates your stewardship of the Cape's natural resources and shows that you care about the Cape's water and a healthy environment.

How do you transition to a Cape Cod lawn?

- **Simply stop irrigating and stop fertilizing. Mow areas just when needed.**
- **If you can't go cold turkey (or your roommate can't), reduce your mowing frequency. It will benefit pollinators and other valuable insect life. If you wish, you can top-dress with compost and overseed bare areas in late spring or early fall with Dutch white clover and drought-tolerant fescue grass seed available at your local nursery.**
- **Allow moss to flourish. (It doesn't need mowing!)**
- **Control invasive species. Know the non-native invaders on your site so that you'll know the appropriate action. For example, if you have bittersweet on your property, you will want to pull any young seedlings that appear or take other action—perhaps mowing areas to keep the invasive species at bay.**
- **Leave some bare sandy spaces to support native ground nesting solitary bees.**
- **Plant trees for shade—this will help your Cape Cod lawn stay greener longer. You'd be surprised what a few hours of shade will do.**
- **While many native plants will show up on their own because they are deposited by the wind, or birds, or existing in the seed bank in the soil, you could actively diversify your lawn with native species by supplementing with native sedges or wild strawberry, and other low-growing native species appropriate for the site.**



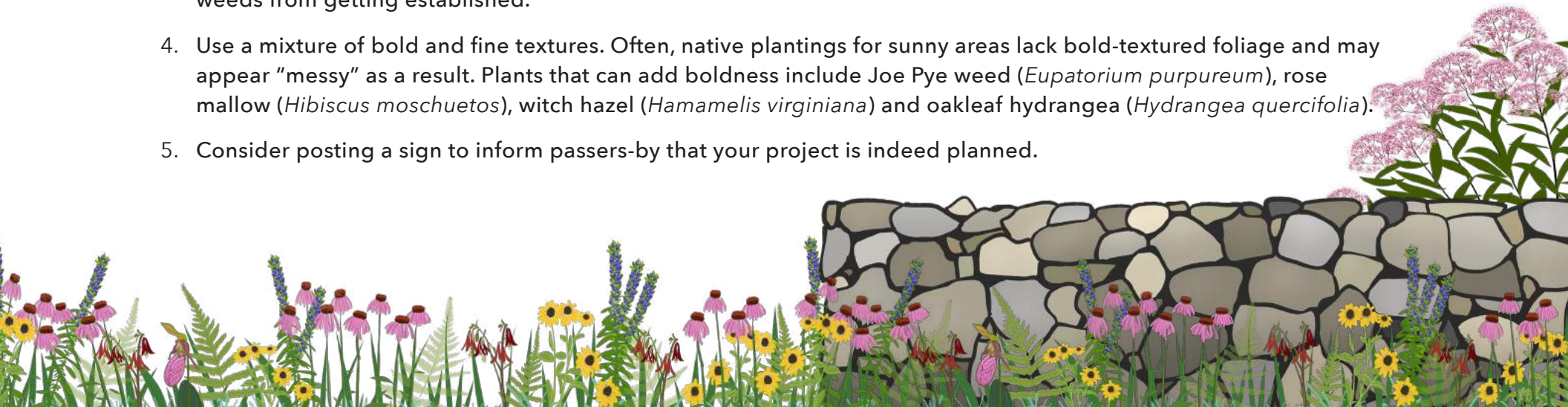
The Form and Bones of Ecological Design

Design with Your Style in Mind

Indeed, beauty is in the eye of the beholder. Embracing ecologically friendly landscape goals can be different for each of us. Design should consider your use of your property, and what level of maintenance is desired, and perhaps who is doing the maintenance.

While many of us adopt the naturalistic style of gardening and perhaps even subscribe to “rewilding,” the random appearance may not be as acceptable to others who need to see their landscape looking, well, a bit more orderly. The following practices apply to plantings where some degree of control is desired. These design elements will help produce a garden that provides visual cues to the average observer.

1. Use borders and paths to define the planting area. Native gardens are found acceptable by the average observer when they have definite shape, borders, and walkways.
2. Develop a focal point. Bold-textured plants, a low stone wall, or something as simple as a birdbath can serve as a focal point.
3. Diversify the layout. Plant two to four species in broad sweeping masses or drifts that repeat throughout the planting area. While large masses of a single species can be quite striking, it is generally easier to control weeds when you include a grass along with flowering plants. Native grasses develop dense fibrous roots that prevent weeds from getting established.
4. Use a mixture of bold and fine textures. Often, native plantings for sunny areas lack bold-textured foliage and may appear “messy” as a result. Plants that can add boldness include Joe Pye weed (*Eupatorium purpureum*), rose mallow (*Hibiscus moschuetos*), witch hazel (*Hamamelis virginiana*) and oakleaf hydrangea (*Hydrangea quercifolia*).
5. Consider posting a sign to inform passers-by that your project is indeed planned.





Take Charge of Water on Your Property

It's especially important on Cape Cod to ensure that rain and melted snow soak into the ground where they fall, wherever possible. Precipitation is the only source of fresh water that replenishes the Cape's aquifer, the source of our drinking water.

When we harden the land with buildings, roadways, parking lots, and driveways, rainwater and snow melt become stormwater. We manage stormwater for public safety on our roadways, and to protect public and private property. However, the old way of managing stormwater has been to convey it away—often, it is directed to wetlands or the ocean, and about eight percent of the excess nitrogen in our waterways is attributed to untreated stormwater runoff.¹

We also now recognize that water is our most precious natural resource. Green infrastructure designs are better ways of controlling stormwater to capture, filter, and minimize runoff. This reduces flooding and ensures that stormwater soaks into the ground and receives some treatment. These designs use nature's functions to treat the stormwater, and often incorporate plants, so that soils, soil microbes and plants can help filter out excess nutrients and other pollutants before they reach groundwater.

For the homeowner, there are a few things that you can do to keep stormwater on your property that will help alleviate the bigger (and more expensive) public stormwater management

issue. These options will help filter precipitation to recharge our groundwater, and protect our surface waters (ponds, lakes, and the ocean) from polluted stormwater.

- **Consider installing a rain garden that receives water from a gutter downspout.**
- **Where you must have a hard surface, consider permeable surfacing.**
- **Plant vegetated buffers - densely plant garden beds between a sloping lawn and a pond or roadway.**
- **Add a rain barrel or connect more than one rain barrel together to capture stormwater from a gutter downspout.**



A Rain Garden

A rain garden is a garden in a depression that receives stormwater. In a residential setting, stormwater is usually from a gutter downspout. A rain garden is best planted with deeply rooted native plants selected based on the site. A rain garden can include perennials, shrubs, and even trees depending on the size. Planted with appropriately selected plants, a rain garden can be a shade garden, in full sun, or somewhere in between.

A rain garden is not a water feature, nor is it a wetland. But it is a garden, and therefore like any garden, will require weeding and even watering, at least until establishment.

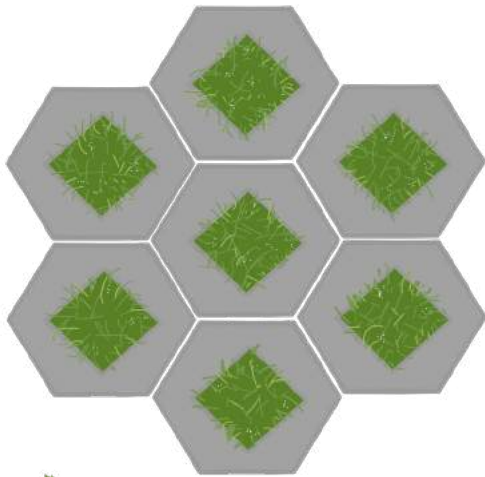
A rain garden can be a stand-alone landscape feature, or, most commonly, can be designed to blend with the rest of the landscape.

For more information on how to install a rain garden and a list of plants to consider, see APCC's website.²



Hardscape

Avoid hardening the land. When you must, minimize asphalt and stonework, and consider permeable alternatives. Permeable alternatives come in different materials, but all have the same function, which is to allow the water to flow through the surface to several inches of compacted stone beneath them. This allows the water to slowly filter into the ground and often within the root zone of nearby plants. The benefit of permeable surfaces is that water does not puddle, nor does it shed off and contribute to stormwater runoff. Some examples of permeable surfacing include permeable pavers, perk-crete™, permeable asphalt, porous-pave™. It is important to hire a certified installer, so that the applications are properly installed and will function as intended.



Vegetated Buffers

When your land slopes, even slightly, the first inch of rain may run downhill before it has time to soak into the ground and may leave your site as stormwater. Vegetated buffers help to control this.³ What is a vegetated buffer? It's just a planting bed, but it can be so much more.

Vegetated buffers can be naturalized areas or can be more formal planting areas. Key to an effective buffer is they should be full of native plant material and be located on your property where they will intercept stormwater and keep it from leaving your property. If you live on a pond, a vegetative buffer can also be an important habitat area.⁴



1. capecodcommission.org/stormwater
2. apcc.org/living-landscape-laboratory/rain-gardens
3. mass.gov/doc/stormwater-solutions-for-homeowners-fact-sheet-vegetated-buffers
4. dec.vermont.gov/LakeWiselyInfoSheet



ECO-LAND CARE BEST PRACTICES - Maintenance

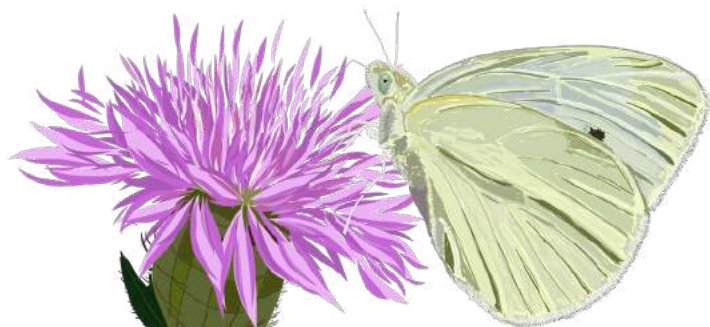


AVOID USING FERTILIZERS.

Fertilizers are an artificial means of growing plants and contribute to the degradation of the Cape's water quality. Whether chemical or organic, adding nutrients to the land contributes to the nitrogen problem. This is why recommendations for more sustainable landscapes include reducing lawn area and choosing native plants that are well-suited to our thin soils.

AVOID USING PESTICIDES.

The term pesticides includes insecticides, fungicides, herbicides, and rodenticides – all meant to kill and none are species-specific. Don't succumb to the marketing ploy to be "proactive" and spray your trees for pests. Insecticides kill all insects. This collateral damage to insect populations means a depletion of the food source for nesting birds and can result in the collapse of local food webs. Even the so-called "safe" or "green" or "organic" versions are still meant to kill, so don't be fooled. If you have a mosquito problem, contact the County Mosquito Program whose job it is to test and address mosquito problems. Spraying for ticks gives a false sense of security as ticks are ubiquitous and a daily tick check is still the best defense. Herbicides and fungicides have unintended consequences on many insects that live in the soil. The yellow signs posted on treated turf lawn are a required-by-law warning to avoid contact – too bad wildlife can't read. If you have a rodent problem, remove the food source (e.g., bird feeders). Indoors, the most humane means of control is to use snap traps. Rodenticides continue to cause death to raptors and other predatory animals that rely on rodents as their main food source. While city living may require a resident to have a pest control contract, here on Cape Cod we'd rather see hawks, owls, foxes, and coyotes be the natural control: the way nature intended.



LEAVE THE LEAVES.

If and where you can, it's best to let fallen leaves be. Fallen leaves help protect soil organisms and plant roots against the winter weather. They also provide food for soil organisms that help recycle the nutrients for plant growth. Fallen leaves give winter protection to a variety of pollinators like queen bumble bees. Some butterflies and moths overwinter as adults, or pupae, and some even camouflage themselves to look like leaves. Ground birds, such as the towhee, find their insect meals scratching around in fallen leaves. You can rake leaves into flower beds or compost them, but don't have them taken away.

ENJOY A WINTER GARDEN.

Leave the stems and seed heads. The seeds can feed winter birds, such as goldfinches and juncos. The stems are sought after by some insects, including certain species of wild bees that lay their eggs in the stems for the next year's bee generation. These overwintering insects can be important winter protein for chickadees and titmice. Some perennials reseed (e.g., wild columbine, smooth-stem beardtongue, and wild bergamot), so allowing the seed heads to remain will help keep your garden regenerated for free!

CHOP AND DROP.¹

If you want to do a late spring cleanup to make the garden look kempt, cut the stems to about 18 inches, chop up what you've cut and drop for mulch in the garden. This is a popular practice that returns organics to the soil where they are helpful in nutrient recycling and holding moisture.

LEAVE SOME WILD AREAS.

Bumble bees, cellophane bees, squash bees, and lightning bugs all need undisturbed areas to complete their life cycles. Brush piles give birds protection against the weather and predators, but also may supply some insect food.



*Gardening is as much an art as a science.
And while there are loads of opportunities
for textbook learning, there's nothing like
learning by doing. Don't stress it!*

*Make your own observations and enjoy
the journey of discovery of the nature
connection in your yard.*

35.

CONTROL INVASIVE SPECIES.

Learn how to identify the worst of our invasive species. If you can catch aggressive non-native plants while they are small and easily pulled, you can keep them at bay. Some of our common invasive species on Cape Cod include Asiatic bitter-sweet, porcelain berry, Japanese knotweed, multi-flora rose, privet, bush honeysuckle, and autumn olive.² There are tried and true methods of control that vary for each species, but in all cases controlling invasive species requires persistence.³

LAWN CARE.

Consider setting the height of mowing as high as your mower can be set. Mow less frequently – studies have shown that reducing the frequency of mowing favors a greater abundance of wild bee species.⁴ Leave the clippings on the lawn to recycle nutrients. Allow the diversity of your lawn to come to life and be accepting of broadleaved plants, such as violets—remember, a Cape Cod lawn shows you care about the Cape's environmental health.

PRUNING.

If you find you need to do work on your trees, please do so December through February while the trees are dormant.⁵ It's best for the tree; and for pines, will avoid encouraging turpentine beetle infestations that are attracted to the sap resulting from the injury/cuts to the tree. Avoid pruning shrubs in the spring as you might inadvertently disrupt nesting birds, such as hummingbirds, whose well-camouflaged nests can easily be missed and destroyed.



MULCH.

Avoid the traditional bark mulch, especially the artificially colored stuff. Opt instead for leaving the leaves, and pine needles, or adding leaf mulch or composted local wood chips.⁶ Some tree companies will agree to drop a load of shredded tree and shrub material. The value of mulch is to help with moisture retention and, to some degree, weed control. However, green mulch (living plants) is best, so allow your plants to knit together to cover the ground.

Some ground layer native plants that are especially good at this: heath aster (*Aster ericoides*), wild geranium (*Geranium maculata*), barren strawberry (*Waldsteinia fragarioides*), Meehan's mint (*Meehania cordata*), golden groundsel (*Packera aurea*), Pennsylvania sedge (*Carex pensylvanica*), purple lovegrass (*Eragrostis spectabilis*), and path rush (*Juncus tenuis*).

1. growingwithnature.org/chop-and-drop
2. massaudubon.org/learn/nature-wildlife/invasive-plants
3. [extension.unh.edu/Mechanical control of invasive plants](http://extension.unh.edu/Mechanical%20control%20of%20invasive%20plants)
4. "To mow or to mow less: Lawn mowing frequency affects bee abundance and diversity in suburban yards." *Biological Conservation*, Volume 221 (2018)
5. *The Tree Care Primer*, Chris Roddick, Brooklyn Botanic Garden Guide (2007)
6. growingwithnature.org/mulch-types



SOME PRACTICAL ADVICE

How to Hire the Right Landscape Professional for Your Cape-Friendly Landscape.

Here are ten tips on hiring a landscape professional for design, installation, and/or maintenance:

1. Remember, the contractor works for you. As with any client-contractor relationship, be clear as to what and how you want your landscape managed, and, importantly, what you do not want done. Do you want your yard to be chemical-free? Then direct them to not use fertilizers, herbicides, pesticides, or fungicides. Know that even organic compounds meant to kill still kill indiscriminately. Do you want your contractor to leave the leaves, plant stems, and seed heads? Mulch-mow the lawn? Hand-weed? Whatever it is you want your contractor to do to help you achieve your Cape-friendly landscape, if they refuse or cannot, then find someone who will care for your yard the way you want it cared for.
2. Does the landscape contractor know how to identify plants? If not, this should be a deal-breaker.
3. Does the contractor have knowledge about pollinators? Does the contractor know what native plants are best supportive of pollinators?
4. Does the contractor know when is the best time to prune trees? (December - February) Do they use biodegradable chainsaw oil and bar oil? Are they a certified arborist? Beware the contractor (arborist or not) that says it's okay to top a live tree or strip all the branches making it a lollipop tree, or wants to just remove the tree instead of conducting proper pruning for the health of the tree.
5. Does the contractor know how to build healthy soils? Will they help you compost on your site?
6. Ask what they use for equipment. There is an industry movement to transition away from gas-powered to electric/ battery-operated yard equipment to reduce noise and carbon emissions. Maybe you want a contractor who no longer uses gas-powered equipment.
7. Does the contractor have an educational background in ecological-friendly land care practices? Does the contractor belong to environmentally oriented organizations such as the Ecological Landscape Alliance, Grow Native Massachusetts, NOFA, APCC, or other professional organizations that promote environmentally sustainable practices?
8. Companies make the most money on the maintenance "treatments." Does the contractor want to sell you fertilizer plans and pest treatments? If so, this is not the contractor for you.



9. Are they familiar with permeable materials and how to manage stormwater on your site?
10. Check references.



Buying Native Plants.

Do Your Homework. It always pays to be an informed consumer.

1. Have a “plan” - know where you want to plant and what you want to plant. Use the plant selector websites for assistance.
2. Make a list of the plants you desire and include the scientific names. Common names vary, and only the scientific names will assure that you are getting the plant species you want. Purchase straight species whenever possible. Remember, names with an additional name in quotes, such as ‘Purple Top’ or ‘Goldstrum,’ denote that the plant is a specific cultivar. Some cultivars support pollinators, others do not. Just like grocery shopping, it’s best to have a list in hand to avoid the impulse buys—and for plant and garden enthusiasts, impulse buys are really hard to avoid!
3. When you know what you want, call around to retail nurseries. It saves time, and sometimes if your local retail nursery doesn’t have what you want, they may be able to get it for you.
4. Avoid purchasing plants treated with neonicotinoids. At your retail nursery, ask for plants that are free of “neonics.” Neonicotinoids are a group of systemic pesticides often used in the nursery trade. (A systemic pesticide is a form of pesticide that is water soluble and absorbed by a plant when applied to its roots, seeds, or leaves. Once the pesticide is absorbed by the target plant, the chemicals in the pesticide will circulate through a plant’s system. This results in the plant killing any insect or pest that feeds on it.) This group of chemicals can express itself in the nectar and pollen as well as in the plant tissues and is toxic to pollinators and other insects. The last thing we want to do is attract pollinators to our garden and then kill them. So, if your retail nursery doesn’t know whether the plants have been treated with neonics (and there’s a good chance they may not), best to take your business somewhere else. There are growers of plants that do not use these pesticides, so keep asking the right question. The Xerces Society offers an informative guide to systemic insecticides on their website.¹

1. xerces.org/systemic-insecticides/list



RESOURCES

Plant Lists

Keystone Plants

- National Wildlife Foundation - [nwf.org/Garden-for-Wildlife](https://www.nwf.org/Garden-for-Wildlife)

Plants for Pollinators

- Pollinator Pathway Cape Cod - pollinator-pathway.org/cape-cod
- Xerces Society - xerces.org/plant-lists

Plants for Rain Gardens

- APCC list for sun and part sun - apcc.org/resources/fact-sheets

Nativars

- Mt Cuba Center - mtcubacenter.org/trial-garden

Plants for Birds and Other Wildlife

- MassWildlife's Natural Heritage & Endangered Species Program - mass.gov/guides
- Mass Audubon - massaudubon.org/learn/nature-wildlife
- National Audubon Native Plant Database - audubon.org/native-plants

Cape Cod Shrubs and Trees

- Trees and Shrubs for Coastal Environments - ag.umass.edu/conservation_list

Cape Cod Lawn

- Wild Seed Project - apcc.org/news-events/diversify-your-lawn
- Presentation by Anna Fialkoff - apcc.org/DiversifyYourLawn_Handout_June2022



Plant Finders/Selectors – websites designed for researching native plant species that fit your location and desired plant characteristics.

- Cape Cod Native Plants – natives appropriate for Cape Cod gardens - CapeCodNativePlants.org
- Native Plant Trust - plantfinder.nativeplanttrust.org/Plant-Search
- Polly Hill Arboretum (Martha’s Vineyard) Plant Selection Guide - pollyhillarboretum.org/plant-selection-guide
- Ladybird Johnson Wildflower Center - wildflower.org

Sources for Purchase of Native Plant and Seed

Mail Order

- Ernst Seeds (seeds by the pound) - ernstseed.com
- Izel Native Plants (plugs) - izelplants.com/all-plants
- Prairie Moon Nurseries (plants and seeds) - prairiemoon.com
- Wild Seed Project, Maine (seeds) - wildseedproject.net

Specialty Nurseries in MA

- Blue-Stem Natives, Norwell - bluestemnatives.com
- Native Plant Trust, Framingham - nativeplanttrust.org/for-your-garden/buy-nativeplants
- New England Wetland Plants, Amherst - newp.com
- Polly Hill Arboretum, West Tisbury, Martha’s Vineyard - pollyhillarboretum.org

Watch for Annual Special Plant Sales!

- Association to Preserve Cape Cod, Dennis - apcc.org
- Grow Native Massachusetts, Waltham - grownativemass.org
- Rhody Native™, Rhode Island - rinhs.org
- Master Gardeners Cape Cod - mastergardenerscc.org

Stormwater

Rain Barrels

- Association to Preserve Cape Cod Rain Barrel Program - apcc.org/rain-barrels

Rain Gardens

- ag.umass.edu/landscape/fact-sheets
- mass.gov/doc/stormwater-solutions-for-homeowners-fact-sheet-rain-gardens
- apcc.org/living-landscape-laboratory



Vegetated Buffers

- mass.gov/stormwater-solutions-for-homeowners-vegetated-buffers

Hardscape

- mass.gov/stormwater-solutions-for-homeowners-reducing-impervious-surfaces

Books

- *Bringing Nature Home, How Native Plants Sustain Wildlife in Our Gardens*, Douglas W. Tallamy (2009)
- *Nature's Best Hope -A New Approach to Conservation That Starts in Your Yard*, Douglas W. Tallamy (2019)
- *Climate-Wise Landscaping: Practical Actions for a Sustainable Future*, Sue Reed and Ginny Stibolt (2018)
- *Integrated Landscaping - Following Nature's Lead*, Chase-Rowell, et. al. (2012)
- *Planting Designs* by Piet Oudolf and Noel Kingsbury (2005)
- *The Living Landscape ~ Designing for Beauty and Biodiversity in the Home Garden*, Rick Darke and Douglas Tallamy (2014)
- *Native Plants for the Small Yard*, Kate Brandes lgnc.org/project/native-plants-for-the-small-yard
- *The Northeast Native Plant Primer: 235 Plants for an Earth-Friendly Garden*, Uli Lorimer (2022)
- *Native Plants for New England Gardens*, Richardson and Jaffe (2018)
- *Native Ground Covers for Northeast Landscapes*, A Wild Seed Project Guide (2022)
- *Native Trees for Northeast Landscapes*, A Wild Seed Project Guide (2021)
- *The Ultimate Guide to Backyard Bugs - Garden Insects of North America* by Whitney Cranshaw (2004)
- *Bees - An Identification and Native Plant Forage Guide* by Heather Holm (2017)
- *Pollinators of Native Plants* by Heather Holm
- *Attracting Native Pollinators* by The Xerces Society (2011)
- *Bees, Wasps, and Ants - The Indispensable Role of Hymenoptera in Gardens* by Eric Grissell (2010)
- *The Tree Care Primer*, by Chris Roddick, Brooklyn Botanic Garden All-Region Guides (2007)

Organizations that promote native plants

- Grow Native Massachusetts grownativemass.org
- Native Plant Trust nativeplanttrust.org
- Ecological Landscape Alliance ecolandscaping.org
- Wild Seed Project wildseedproject.net
- Wild Ones wildones.org
- Pollinator Pathway Cape Cod pollinator-pathway.org/cape-cod
- Home Grown National Park homegrownnationalpark.org
- The Xerces Society xerces.org
- National Wildlife Federation nwf.org

